**Section 622.30 Persons in Possession of Water Treatment Residuals**

a) The following persons shall register with the Agency within 60 days of producing or possessing water treatment residuals:

1) Water treatment facilities permitted by the IEPA that treat groundwater with a treatment technology identified in subsections (a)(2)(B).

AGENCY NOTE: Persons who possess groundwater wells only as an emergency or backup source (i.e., a primary source of purchased or surface water) do not meet the registration requirements in subsection (a)(1) or (a)(2).

2) Water treatment facilities permitted by IEPA whose groundwater sources and utilized treatment technologies are identified in subsections (a)(2)(A) and (B):

A) Table 1. Aquifers designated to contribute elevated concentrations of radium to groundwater:

i) Cambrian

ii) Ordovician

iii) Devonian

iv) Silurian

v) Any other aquifer that gives rise to a maximum contaminant level for combined radium as specified in 35 Ill. Adm. Code 611.330.

B) Table 2. Treatment Technologies Capable of Concentrating Radium:

i) Ion exchange

ii) Reverse osmosis

iii) Lime softening

iv) Green sand filtration

v) Co-precipitation with Barium sulfate

vi) Electrodialysis/electrodialysis reversal

vii) Pre-formed hydrous manganese oxide filtration

viii) Activated alumina

ix) Enhanced coagulation filtration

x) Any other treatment technology that increases the combined radium concentration in the media or resulting water treatment residuals beyond that which is naturally present.

3) Wastewater treatment facilities permitted by IEPA and receiving treatment process backwash from a water treatment facility described in subsection (a)(2).

4) IEPA-permitted municipal solid waste landfills if the water treatment residuals generated by a registrant identified in subsections (a)(1), (a)(2), or (a)(3) are disposed of in those landfills;

5) Land applicators permitted by IEPA who apply water treatment residuals generated by a registrant identified in subsections (a)(2) or (a)(3); and

6) Any other person that the Agency determines is required to register.

b) Registrants in compliance with Section 622.30 who elect to dispose of water treatment residuals at a licensed low-level radioactive waste disposal facility will be exempted by the addition of Section 622.30(m).

c) Registrants may dispose or repurpose water treatment residuals under the provisions of this subsection (c) and the requirements of Title 35 of the Illinois Administrative Code, Subtitles C and G, as implemented by IEPA:

1) If the concentration of combined radium in the water treatment residuals is greater than 3.1 pCi/g and less than or equal to 100 pCi/g (dry weight basis), water treatment residuals may be:

AGENCY NOTE: Water treatment residuals with a combined radium concentration less than or equal to 3.1 pCi/g (dry weight basis) are not subject to the disposal requirements in this Section. However, registrants must maintain records of the combined radium concentration and the location where the material was disposed of.

A) Disposed at a facility authorized to receive such material under any federal or State solid or hazardous waste laws provided:

i) Combined radium concentration in pCi/g (dry weight basis) has been determined by a laboratory meeting the accreditation requirements in subsection (e)(1) with methods approved by the USEPA in Title 40 of the Code of Federal Regulations or by a screening method approved by the Agency in accordance with subsections (c)(1)(A)(ii);

ii) A registrant may apply to the Agency for approval to use a screening method instead of laboratory analysis to determine the combined radium concentration of water treatment residuals. Each application shall include: a description of the water treatment residuals being screened, including the physical and chemical properties of the material; a description of the proposed screening method including instruments or equipment to be used, calculations performed, and procedures for how a representative combined radium concentration can be obtained; and analyses and procedures to ensure that doses are maintained ALARA and within the dose limits in this Section;

iii) Water treatment residuals transported in compliance with the Illinois Vehicle Code [625 ILCS 5/15-109];

iv) Water treatment residuals that are easily dispersible are packaged or stabilized to prevent dispersion during transportation and/or landfill placement;

v) There is at least 10 feet of non-contaminated overburden between the water treatment residuals and grade level (at the time of landfill closure); and

B) Used for soil conditioning purposes on agricultural cropland (e.g., corn, soybeans) provided:

i) Land application is performed in accordance with and under the authorization of a current IEPA land application permit;

ii) Water treatment residuals are transported in compliance with the Illinois Vehicle Code [625 ILCS 5/15-109] covered during transportation;

iii) The combined radium concentration of the water treatment residuals (in pCi/g, dry weight basis) has been determined by a laboratory meeting the accreditation standards in subsection (e)(1) with methods approved by the USEPA in Title 40 of the Code of Federal Regulations or by a screening method approved by the Agency in accordance with subsection (c)(1)(B)(iv);

iv) A registrant may apply to the Agency for approval to use a screening method instead of laboratory analysis to determine the combined radium concentration of water treatment residuals. Each application shall include: a description of the water treatment residuals being screened, including the physical and chemical properties of the material; a description of the proposed screening method including instruments or equipment to be used, calculations performed, and procedures for how a representative combined radium concentration can be obtained; and analyses and procedures to ensure that doses are maintained ALARA and within the dose limits in Section 622.30.

v) Water treatment residuals shall be incorporated in accordance with the registrant’s land application permit. All water treatment residuals applied to land for soil conditioning purposes under this subsection (c)(1)(B)(v) shall be mixed with soil such that the limits specified in items (vi) and (viii) are not exceeded;

vi) The concentration of combined radium in the water treatment residuals and the application rate is such that, after the water treatment residuals are mixed with soil, the cumulative increase of the combined radium concentration in the soil does not exceed 1.0 pCi/g (compliance with this Section shall be calculated as an addition of 1778 microcuries per acre, dry weight basis);

vii) This increased limit applies to the sum of all land applications of water treatment residuals on a specific tax parcel of land;

viii) At no time shall the application of water treatment residuals result in the combined radium concentration in the soil exceeding 3.1 pCi/g (the mean natural background as determined by the Agency of 2.1 pCi/g and the soil concentration increase limit of 1.0 pCi/g due to water treatment residuals application);

ix) The landowner or an authorized agent of the landowner must acknowledge awareness that water treatment residuals are being applied to the land (this acknowledgement must be updated as landownership changes). The acknowledgement shall contain, at a minimum, the language provided in 622.APPENDIX A;

x) Before using a parcel of land for the application of water treatment residuals for the first time, the registrant must determine the combined radium concentration in the soil;

xi) Soil sample collection shall be conducted to be representative of the entire water treatment residual application site at a depth of 12 inches and may be submitted for analysis as a single composite sample;

xii) Land receiving application of water treatment residuals shall not be used for the cultivation of tobacco; and

xiii) When calculating the increase in combined radium concentration, a soil density value of 90 pounds/cubic foot and a mixing depth of 1 foot shall be used unless the registrant is utilizing site-specific soil density values. Corrections to the cumulative increase of combined radium may be adjusted for the decay of radium-228.

C) Disposed by release into sanitary sewerage.

D) Disposed using an alternative method approved by the Agency before disposal, under 32 Ill. Adm. Code 340.1020.

2) If the concentration of combined radium in the water treatment residuals is greater than 100 pCi/g (dry weight basis) and less than or equal to 200 pCi/g (dry weight basis), water treatment residuals may be disposed of:

A) Using an alternative method approved by the Agency before disposal, under 32 Ill. Adm. Code 340.1020;

B) In an IEPA-permitted facility authorized to receive such material. Disposals shall:

i) Be reviewed and approved by the Agency in advance.

ii) Comply with all requirements in subsection (c)(1)(A).

C) By release into sanitary sewerage.

D) At a facility authorized to dispose of such material under any federal or State solid or hazardous waste laws as long as the registrant ensures compliance with 32 Ill. Adm. Code 340.1060, as applicable.

d) Registrants identified in subsection (a)(2), which requires workers, contractors, or other persons to come into contact with water treatment residuals during routine and maintenance work shall sample the residuals and receive results before the next scheduled service, or as soon as practicable for emergency work, to determine compliance under this Section and Section 622.40 and to identify potential worker exposure concerns.

e) All analysis of water treatment residuals shall be conducted:

1) By a laboratory certified to perform radiological analysis by the U.S. Environmental Protection Agency, the International Organization of Standardization (ISO 17025- general requirements for the competence of testing and calibration laboratories), or the National Environmental Laboratory Accreditation Conference (NELAC). The combined radium concentration will be determined by a method approved by the Agency.

2) At a frequency specified in the registrant’s IEPA land application permit. If an IEPA permit does not specify a radium sampling frequency, or for landfill or alternative disposals approved by the Agency, sample frequency shall be no less than one representative sample per year.

3) Utilizing a sampling methodology that ensures analyses are representative of the water treatment residuals being disposed of or repurposed. The registrant shall:

A) Utilize applicable guidance, such as EPA SW-846, American Water Works Association B100, or USEPA’s RCRA Waste Sampling Guidance, where procedures for representative sampling are absent (i.e., those for disposal of water treatment resins or filters);

B) To the extent practicable, collect samples before removing the water treatment residuals from the treatment system; and

C) Ensure composite samples comply with the following requirements:

i) Sub-samples comprising a composite shall be drawn from homogenous waste (i.e., process waste that has been shown to be homogenous);

ii) If homogeneity cannot be confirmed, then a representative composite sample comprised of six sub-samples shall be taken to determine the average concentration;

iii) No single measurement used to calculate an average shall exceed five times the exemption criteria (i.e., 1000 pCi/g); and

iv) Each waste container is considered a separate waste volume (i.e., two waste volumes cannot be averaged).

f) Nothing in this Section relieves the registrant from complying with all other applicable federal, State and local government regulations governing toxic or hazardous properties of water treatment residuals that are disposed of or repurposed under this Section.

g) No person producing or possessing water treatment residuals shall cause violations of the requirements of Title 35 of the Illinois Administrative Code, Subtitles C and G, as implemented by the IEPA.

h) The total effective dose equivalent to workers or individual members of the public from the registrant’s operation shall not exceed 1 millisievert (0.1 rem) in any year, exclusive of the dose contribution from:

1) Background radiation;

2) Any medical administration the individual has received;

3) Exposure to individuals administered radioactive material and released in accordance with 32 Ill. Adm. Code 335;

4) Voluntary participation in medical research programs;

5) A radioactive material licensee's disposal of radioactive material into sanitary sewerage under 32 Ill. Adm. Code 340.1030; and

6) Radon and its progeny.

i) Registrants shall limit radon exposure to workers.

1) Registrants identified in subsections (a)(1), (a)(2), and (a)(3) shall conduct radon measurements in accordance with 32 Ill. Adm. Code 422 by [date certain], and at least once every five calendar years following the initial testing.

A) Measurements shall be conducted immediately before exchanging of exhausted filter media, or if the media is not scheduled to be exchanged during the measurement window, as close to the end of the measurement window as practical to allow for maximum loading of radium onto the filter media.

B) Radon concentrations shall be retested following the guidance outlined above within a year of any of the following circumstances occurring:

i) A new addition is constructed or alterations for building reconfiguration or rehabilitation occur;

ii) A ground contact area not previously tested is occupied;

iii) Treatment technologies capable of concentrating radium are newly installed or altered. Altering treatment technologies does not include activities such as replacing worn-out equipment or filter media while leaving the remainder of the system unchanged;

iv) A facility begins receiving treatment process backwash from a new (additional) water treatment facility or alterations are made to the treatment technologies at existing facilities that supply treatment process backwash. Alterations to treatment technologies do not include activities such as replacing worn-out equipment or filter media while leaving the remainder of the system unchanged;

v) The use of a new or different primary water source drawn from an aquifer designated to contribute elevated concentrations of radium to groundwater;

vi) Heating or cooling systems are altered with changes to air distribution or pressure relationships;

vii) Ventilation is altered by extensive weatherization, changes to mechanical systems, or comparable procedures;

viii) Alterations or renovations resulting in sizable openings are made to the facility’s foundation, or flooring or natural settlement occurs causing major cracks to develop; or

ix) An installed mitigation system is altered or repaired.

AGENCY NOTE: Agency recommends radon mitigation when radon concentrations in routinely occupied areas are found to be greater than 4.0 pCi/L, and recommends considering mitigation for concentrations between 2.0 and 4.0 pCi/L.

2) Registrants shall ensure that worker exposure from radon within all occupied areas does not exceed 30 pCi/L or 0.3 WL, based on continuous workplace exposure for 40 hours per week, 52 weeks per year, and shall not exceed 4 WLM over a 12-month period, using an equilibrium ratio of 50 percent to convert radon exposure to WLM.

j) Persons producing or possessing water treatment residuals shall not cause contamination of any area exceeding the values specified in Appendix A of 32 Ill. Adm. Code 340.

k) For fixed facilities, registrants shall comply with 32 Ill. Adm. Code 340.920(e) and post each area, tank, basin, or room in which an amount of material exceeding ten times the quantity of radium-226 and radium-228 specified in Appendix C to 10 CFR 20, effective January 1, 2004, is used or stored with a conspicuous sign or signs bearing the radiation symbol and the words "CAUTION RADIOACTIVE MATERIALS" or "DANGER RADIOACTIVE MATERIALS". Areas visible to the public may be posted within the confines of the barrier (fencing, hatch, etc.) but must remain visible to workers entering the restricted area;

AGENCY NOTE: The referenced value is 1.0 microcurie. This equates to 5 kg at 200 pCi/g.

l) Registrants shall comply with 32 Ill. Adm. Code 310.60 through 310.90, the Radon Industry Licensing Act [420 ILCS 44] and 32 Ill. Adm. Code 422.

m) Registrants in compliance with Section 622.30 are exempt from the requirements of 32 Ill. Adm. Code 340.1060(e).